REMARKS

DISCUSSION OF SPECIFICATION

The Cross-Reference To Related Applications has been amended to include the missing serial number. Acceptance of the amended specification is respectfully requested.

DISCUSSION OF CLAIMS

In the Office Action, claims 1, 2, 5, 6, 7, 11, and 33 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,601,615 to Markowitz et al.

In the Office Action, claims 3, 4, 8-10, 12-18, 22-29, 30-32, and 34-39 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,601,615 to Markowitz et al. in view of U.S. Patent No. 6,129,746 to Levine et al.

In the Office Action, claims 19-21 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,129,746 to Levine et al.

In response thereto, claims 19-21, 30-32, and 37-39 have been cancelled, and claims 1, 5, 6, 22, and 33 have been amended. Accordingly, claims 1-18, 22-29, and 33-36 are now pending.

Independent Claim 1

Claim 1 recites a method of performing an automatic capture threshold test in an implantable cardiac stimulation device. The method comprises loading an adjustable, user-provided atrio-ventricular delay setting, delivering a series of ventricular stimulation pulses following successive expirations of the atrio-ventricular delay setting, verifying if capture occurs for each ventricular stimulation pulse, and defining a ventricular capture threshold based on capture verification data.

The present application is directed to avoiding obligatory shortening of the AV and PV delay settings during automatic capture threshold testing. Shortening of the AV

and PV delay settings during automatic threshold testing and evoked response sensitivity testing may have undesirable effects in some patients such as deleterious hemodynamic effects which may contribute to adverse symptoms or hypotension (see specification, page 6, line 8 through page 8, line 12). Furthermore, in patients with first degree or more severe atrial-ventricular conduction block, the shortened AV and PV delays are not required in order to perform a threshold test without encountering fusion. Thus, automatic obligatory shortening of the AV and PV delays to a non-physiologic interval may be unnecessary and undesirable.

Furthermore, obligatory shortening of the AV and PV delay settings are typically performed during evoked response sensitivity tests. While this situation eliminates the problem of fusion for measurement purposes, it may not reflect the normal day-to-day operating conditions of the stimulation device. Automatic capture verification will be enabled with settings that are valid at the tested AV and PV delays but may not be the optimal settings at the final programmed AV and PV delays settings. Thus, it would be desirable to load an adjustable, user-provided AV and PV delays settings.

The Markowitz et al. reference discloses an implantable pulse generator having a microprocessor (304) which defines variable A-V intervals and variable ARPs and VRPs which vary with the escape interval established in response to patient activity (see section titled "Part I. Description of the IPG and Leads, " column 9, lines 21-37). For example, the microprocessor may specify a variable rate adaptive decrement interval (RAD) to be subtracted from the defined A-V delay intervals when the heart rate (paced or sensed) is above a defined resting or "start" rate. However, the variable A-V intervals discussed in the section titled "Part I. Description of the IPG and Leads" are implemented during non capture threshold testing such as ordinary pacing of the heart. In the section titled "Part II. Capture Detection and Threshold Measurement," nowhere does the Markowitz et al. reference disclose or suggest implementing variable A-V delays. During threshold measurements, the Markowitz et al. reference discloses setting the A-V delay to a fixed 30 ms (see column 18, lines 65-67).

The Levine et al. reference is cited in the Office Action because it discloses adjusting the frequency of threshold tests based on the variance of data. Nowhere does the Levine et al. reference disclose or suggest loading an adjustable, user-provided atrio-ventricular delay setting to perform an automatic capture threshold test.

Accordingly, it is respectfully submitted that claim 1 is in condition for allowance.

Dependent Claims 2-18

Claims 2-18 depend from claim 1 and are similarly patentable. Accordingly, it is respectfully submitted that these claims are in condition for allowance.

Independent Claim 22

Claim 22 recites a cardiac stimulation device comprising a control circuit that loads an adjustable, user-provided atrio-ventricular delay setting to perform an automatic capture test.

For at least the same reasons discussed above with regards to claim 1, it is respectfully submitted that claim 22 is in condition for allowance.

Dependent Claims 23-29

Claims 23-29 depend from claim 22 and are similarly patentable. Accordingly, it is respectfully submitted that these claims are in condition for allowance.

Independent Claim 33

Claim 33 recites a cardiac stimulation device comprising means for acquiring an adjustable, user provided atrio-ventricular delay setting to perform an automatic capture threshold test.

For at least the same reasons discussed above with regards to claim 1, it is respectfully submitted that claim 33 is in condition for allowance.

Dependent Claims 34-36

Claims 34-36 depend from claim 33 and are similarly patentable. Accordingly, it is respectfully submitted that these claims are in condition for allowance.

CONCLUSION

In light of the above claim amendments and remarks, it is respectfully submitted that the application is in condition for allowance, and an early notice of allowance is requested.

Respectfully submitted,

9/23/04
Date

Ronald S. Tamura, Reg. No. 43,179
Patent Attorney for Applicant

CUSTOMER NUMBER: 36802